

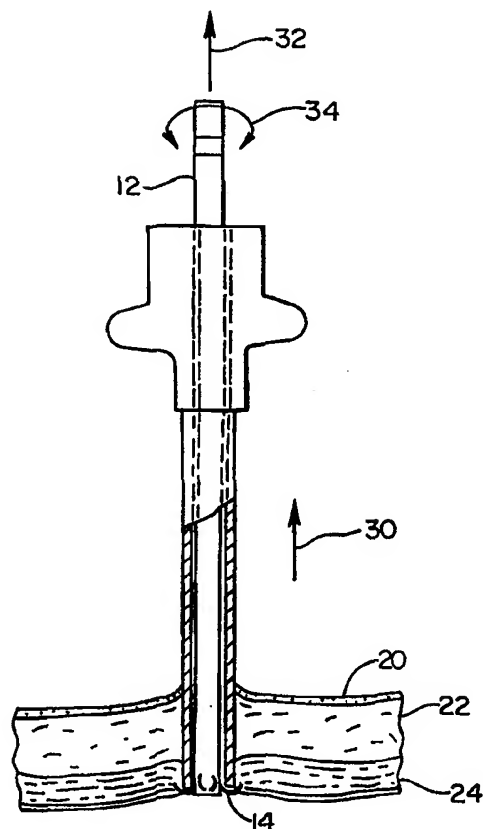


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A61B 17/00, 17/39	A3	(11) International Publication Number: WO 99/13779 (43) International Publication Date: 25 March 1999 (25.03.99)
(21) International Application Number: PCT/US98/19682 (22) International Filing Date: 18 September 1998 (18.09.98) (30) Priority Data: 932,990 18 September 1997 (18.09.97) US (71) Applicant: SCIMED LIFE SYSTEMS, INC. [US/US]; One SciMed Place, Maple Grove, MN 55311-1566 (US). (72) Inventors: LAFONTAINE, Daniel, M.; 11400 5th Avenue North, Plymouth, MN 55441 (US). HARRISON, Kent, D.; 15407 Elm Road North, Maple Grove, MN 55311 (US). (74) Agents: SEAGER, Glenn, M. et al.; Crompton, Seager & Tufte, LLC, Suite 895, 331 Second Avenue South, Minneapolis, MN 55401-2246 (US).		(81) Designated States: CA, JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims</i> <i>and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 6 May 1999 (06.05.99)

(54) Title: WOUND CLOSURE DEVICE AND METHOD**(57) Abstract**

An apparatus and method are provided for closing a perforation in a wall of a patient's blood vessel or other organs. The apparatus includes an elongated support member having a distal end supporting one or more tissue engaging hooks configured to engage fibrous vessel tissue when moved in a first direction and to disengage the tissue when moved in a second direction, and a proximal end for applying rotational torque to the support member to cause the hooks to engage collagen fibrous tissue in the adventitia of the blood vessel or fibrous tissue in other body organs. The hooks engaging the collagen fiber causes the blood vessel tissue surrounding the perforation to be drawn into close proximity such that the perforation can be closed. The apparatus is deployed in an outer sheath with the hooks encased until a selected engaging location has been achieved. Puncture closure can be accomplished by various techniques, including stasis, cauterizing, or by clamping.



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/19682

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61B17/00 A61B17/39

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 07741 A (YOON) 6 March 1997	1,2,5,6, 40-45, 48-53, 55,56
Y	see abstract; figures 1,3,6-10	3,4,46, 47,54
X	US 5 176 692 A (WILK) 5 January 1993 see column 4, line 17-29; figures 3,4	1,2,5
Y	WO 95 26683 A (BOSTON SCIENTIFIC) 12 October 1995 see abstract; figure 2	3,4
X A	US 5 342 393 A (STACK) 30 August 1994 see column 4, paragraph 3	1,40 46,47,54
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

8 December 1998

Date of mailing of the international search report

11.03.99

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INTERNATIONAL SEARCH REPORT

Intern. Appl. No.

PCT/US 98/19682

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	DE 196 10 333 A (MAUSBACH) 18 September 1997 see abstract; figures 3,4 ---	46,47,54
A	FR 2 546 069 A (CNRS) 23 November 1984 see abstract; figures 1-4 -----	46,47,54

INTERNATIONAL SEARCH REPORT

I. International application No.
PCT/US 98/19682

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 9-13
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-6, 40-56

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-6,40-56

Closing device allowing manipulation for closure of puncture, in particular with (blood flow) locator or dissolvable connection.

2. Claims: 1,7,8,31-39,57,58

Closing device with heating element for cautery for sealing puncture

3. Claims: 14-30

Closing device with tissue engaging hooks on the outer surface of support member

4. Claims: 59-64

Closing device with elastic ring and hook and pile structure for closing puncture

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/19682

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